ABSTRACT OF THE DISCLOSURE

A porous diffusion media according to the present invention is positioned against a catalyst layer of the membrane electrode assembly, the porous matrix comprises carbon paper, and the water transfer particles comprise carbon fibers or powders. Relatively high and relatively low water transfer particle density regions alternate across the porous diffusion media. A first major face of the media may be collectively more hydrophilic than the second major face and the second major face may be collectively more hydrophobic than the first major face. The diffusion media is positioned against the catalyst layer along the first major face of the diffusion media and against a flow field of the fuel cell along the second major face of the diffusion media. The porous diffusion media comprises hydrophobic material disposed along the second major face of the diffusion media.